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ABSTRACT

The Competency-Based Instruction (CBI) course at Arizona State University was designed to teach preservice and inservice teachers how to develop the components of a CBI program. They were taught how to: (1) divide a program of their choice into instructional units, (2) write instructional outcomes for the instructional units, (3) prepare materials for assessing pupil attainment of the instructional outcomes, and (4) prepare plans for providing information and practice needed to attain the instructional outcomes. These comprised the first four units of the course, while a fifth unit provided an opportunity to apply these procedures to a second instructional unit. Course materials and procedures were designed to teach these competencies. In a tryout of the course 95% of those who participated attained a competence of at least 70%. The course was revised to include eleven competencies, some changes in assessment procedures, and use of self-instruction materials. (Author/LS)

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TEACHING TEACHERS TO DEVELOP COMPETENCY-BASED INSTRUCTIONAL PROGRAMS

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The Competency-Based Instruction (CBI) course at Arizona State University was designed to teach preservice and inservice teachers how to develop the components of a competency-based instructional program. In this course, teachers were taught how to:

(1) divide a program of their choice into instructional units,

(2) write instructional outcomes for the instructional units,

(3) prepare materials for assessing pupil attainment of the instructional outcomes,

(4) prepare plans for providing information and practice need to attain the instructional outcomes.

The course materials and procedures designed to teach these competencies, their tryout, and their revision based on the results of the tryout are described in this paper.

Course Materials and Procedures

Instruction in the course was divided into units that corresponded to the four competencies the teachers were expected to acquire. In the first unit the teachers were taught how to select a program for development and how to divide a program into instructional units. In the second unit they were taught to write instructional outcomes for one of the units in the program they selected to develop. In the third unit they were taught to prepare materials for assessing pupil attainment of the outcomes they wrote for one of the units in their program. In the fourth unit they were taught to prepare instructional plans that describe the information and practice needed to attain the outcomes they wrote for one of the units in their program. The fifth unit provided an opportunity for the teachers to prepare instructional outcomes, assessment materials, and instructional

plans for a second unit in the program they selected to develop. Current issues related to competency-based instruction were also discussed in the fifth unit.

The materials developed for the course consisted of Instructor Notes, Practice Exercises, and Application Assignment Checklists for each instructional unit. The Instructor Notes contained the information (cues) needed to perform the competencies taught in each unit and suggestions for how the competency should be taught. The instructor presented the information contained in the Instructor Notes, demonstrated how the competency applied to a wide range of school subjects and grade levels, and discussed general questions raised by the teachers.

The Practice Exercises required the teachers to apply the competencies on which they had been instructed to one of three instructional programs: elementary time telling, intermediate physical science, or secondary social studies. The teachers completed the practice exercises at home then met in small groups (15-20 teachers) with an assistant instructor to discuss their work and receive feedback concerning the adequacy of their practice.

At the conclusion of each unit in the course the teachers were required to apply the competencies taught and practiced in the unit to the programs that they had selected to develop into competency-based programs. The instructors used the Application Assignment Checklists to assess each teacher's competency and to suggest possible revisions when an assignment did not meet the criteria specified on the checklists. For a more detailed description of the CBI course materials and procedures see Reiser and Higgins (1975).

Tryout of the CBI Materials and Procedures

The course materials were tried out at Arizona State University during the Spring semester 1975. Fifty-four (54) teachers enrolled in the course to complete a program requirement in audiovisual education (3), library science (3), or special education (48). Forty-five (45) of the teachers enrolled in the course were undergraduate preservice teachers, nine (9) were graduate inservice teachers. Six (6) of the preservice teachers withdrew from the course, leaving a total of 48 teachers who completed the course. The course was taught by an associate professor of educational technology and two graduate student assistants. All three instructors had been involved in developing the materials and procedures used in the course.

Data were collected on (1) the teachers' attainment of the course competencies as measured on the Application Assignment Checklists, (2) the teachers' attitudes toward the course as indicated on a course evaluation questionnaire, and (3) the instructors' observations of the effectiveness of the course materials and procedures as described during weekly staff meetings.

Results of the Course Tryout

The overall level of competence attained by the teachers on the application assignments is presented in Table 1. The level of competence is expressed as the percentage of criterion items satisfactorily met on

Table 1
Number of Teachers X Level of Competence Attained

Level of Competence	Teachers
90-100%	8
80- 89%	31
70- 79%	7
0- 69%	2

the Application Assignment Checklists. The two teachers who attained less than 70% level of competence did not submit all of the assignments required in the course.

Forty-three (43) teachers completed an anonymous course evaluation questionnaire at the conclusion of the tryout. Fifty-five percent of the teachers agreed with the statements, "I learned a lot in the course" and "I intend to use the competencies taught in the course"; eighteen percent disagreed with these statements. Forty-four percent of the teachers agreed that "the large group instruction was a valuable part of the course," thirty-five percent disagreed with this statement. Forty-six percent of the teachers agreed that "the practice exercises were a valuable part of the course," thirty-seven percent disagreed with this statement.

The course instructors made the following observations concerning the course materials and procedures used in the tryout.

- The teachers did not perceive the instruction and practice exercises to be particularly relevant, because they included a wide range of examples not specifically related to the programs they were required to develop for the graded application assignments.
- The individual application assignments did not represent the range of subject areas, grade levels, and pupil performances taught in the course or likely to be encountered in the field.
- The assessment of the application assignments required an inordinately large amount of instructor time to establish reliability and then to score the individual assignments. (The time required to score an individual application assignment ranged from 20 to 45 minutes.)
- The amount of teacher time required to complete an application assignment and the level of competence attained on the assignment seemed to be related to the subject area selected for development. (Teachers who selected elementary mathematics programs to develop attained higher levels of competence than teachers who selected language arts programs, social studies programs, or other instructional programs.)

Discussion of the Tryout Results and Course Revisions

The instructor-developers of the course were generally satisfied with the level of competence demonstrated by the teachers in preparing competency-based instruction components for the programs they chose to develop. Ninty-five percent of the teachers attained an overall competence level of at least 70%, which the instructors had arbitrarily established as a minimum level of competence for a passing course grade (C). The majority of the teachers (55%) indicated that they felt they had "learned a lot in the course" and that they would "use the competencies acquired in their teaching."

Two major problems were revealed during the tryout of the course. The first concerned the need to widen the range of subject areas, grade levels, and pupil performances when assessing the teachers' attainment of the course competencies. The second concerned the need to improve the efficiency of the assessment materials and procedures used in the course. The developers revised the structure of the course and nature of the teacher assessment activities in an effort to solve the two major problems associated with the course.

The initial version of the course had four competencies the teachers were expected to attain: (1) dividing a program into instructional units, (2) writing instructional outcomes, (3) preparing assessment materials, and (4) preparing instructional plans. These competencies were assessed at the end of each of the four units into the course and again during the fifth and final unit of the course, using a program the teacher chose to develop into a CBI program.

The number of competencies assessed in the course was revised to include eleven competencies that had previously been taught as enroute

competencies in the course but that had not been formally assessed. The additional competencies are: distinguishing instructional outcomes from instructional activities, identifying well written instructional outcomes, identifying worthwhile instructional outcomes, writing instructional outcomes for a variety of school subjects, identifying appropriate assessment items, identifying well written assessment items, writing assessment items for a variety of instructional outcomes, identifying appropriate instructional cues, identifying appropriate practice activities, sequencing enroute instructional outcomes, and writing instructional cues for a variety of outcomes.

The course was restructured in the following manner. The content and sequence of the instructional units remained essentially the same. The practice and assessment materials used in each unit were altered in accordance with the decision to assess additional competencies in the course. The application assignments were moved from the end of each unit to the end of the course where they constitute the fifth unit. Unit tests that assess three or four related competencies were developed to replace the application assignments that came at the end of each unit. The current issues that had been discussed in the fifth unit were integrated into the other four units.

Unit Tests were developed to assess the revised competencies dealing with outcomes, assessment, and instruction. The unit tests are designed to sample a wider range of school subjects, grade levels, and pupil performances than the application assignments sampled. The items on the unit test require selected responses or brief constructed responses which are efficient to take and to score. The tests are designed to be

scored in 3 to 5 minutes.

Practice Exercises which had previously required the teachers to apply the competencies taught in the course to the development of one of three given programs were revised to correlate with the competencies assessed on the unit tests. The practice exercises like the unit tests are designed to sample a wide range of school subjects, grade levels, and pupil performances.

Application assignments which required the teachers to develop an instructional program into a competency-based program were revised to limit the teachers' choice of programs for development. Where the teachers previously could choose to develop any instructional program, they are now limited to two given programs. Limiting the program choices to two given programs equalizes the conditions under which the teachers demonstrate their competence and greatly improves the efficiency and reliability of the scoring. The teachers now complete the application assignments in class using the same sets of instructional resources. The instructors only need to be familiar with two sets of instructional resources and are able to determine more specifically the characteristics of acceptable responses to the assignments.

The revisions made in the course materials and procedures have been designed to increase the competencies of teachers and to improve the efficiency of procedures used to assess the teachers' competence. A tryout of the revised course materials will be conducted for the purpose of verifying their effectiveness and their efficiency. The development of the course is expected to continue for at least one more year. The additional development will include preparation of self-instructional materials to replace the existing lecture/demonstrations and the

preparation of alternate forms of the assessment materials. When completed, these developments will permit greater individualization of instruction and assessment within the course and more wide spread implementation of the course in other teacher training settings.

References

Reiser, R. and Higgins, N. Competency-based instruction. Paper presented at the annual meeting of the Association for Educational Communications and Technology, Dallas, Texas, 1975.